



## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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| (54) Title: BEVERAGE DISPENSER  |  |    |  |
| (57) Abstract   |  |    |  |
| <p>A dispenser unit for chilled beverages including a housing (11) for receiving a collapsible bladder containing a beverage and an outlet tap (22) for dispensing the beverage. The tap protrudes through an aperture (16) provided on the housing and is locked into a cradle (20) forming a part of the aperture by means of a slidably holding member (21) which releasably holds the tap in the aperture. The slidably element (21) may include resilient locking legs (60, figures 5, 6) which prevent the element being separated from the housing. The housing may include a removable bladder holder (15). The unit may include refrigeration means.</p> |  |    |  |
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1.

**BEVERAGE DISPENSER**

5 The present invention relates to improvements in or relating to dispensers, and more particularly but not exclusively to improvements to dispensers for beverages such as water.

**BACKGROUND OF THE INVENTION**

10 Dispensing units for beverages such as spring water are becoming increasingly popular, particularly in areas where the quality of mains water is questionable or is simply unpalatable.

15 A typical dispenser unit for spring water currently in widespread use comprises a refrigerated sump on which a large transparent plastic bottle is mounted. Mounting the bottle on the unit generally involves removing the seal from the bottle, and lifting the bottle to approximately waist height while inverting the bottle whereupon the inverted bottle is mounted on the unit with the neck of the bottle extending into the sump.

20 In this arrangement, the bottles are heavy, being generally approximately 18 kilograms, and cumbersome. The requirement to lift the bottle to at least waist height whilst inverting it is potentially injurious as it places particular strain on the back and arms. It is noted that occupational health and safety guidelines specify a maximum weight limit of 16 kilograms which can be safely lifted by females, leading to a potentially unsafe situation in instances where females are required to replace the bottles on the dispenser.

25 In addition, spillage of bottle contents more often than not occurs from the open neck of the bottle during inversion of the bottle for placement on the dispenser.

30 Furthermore, with units of this type the only part of the unit refrigerated is the sump, which contains only a relatively small volume of water at a given time. As the water bottles are stored at room temperature, significant volumes of chilled water are not continuously available. This can be particularly disadvantageous in warm climates or in periods of hot weather when large volumes of chilled beverage are required for refreshment.

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## 2.

In addition, the size and shape of the bottles is such that they cannot be stacked with any safety and hence a significant amount of storage space is required, as the bottles are normally delivered in bulk rather than on an individual basis.

5 Accordingly, in an office environment or indeed in any other environment, a large amount of floor space is required to store the bottles. This can be particularly unsightly in cases where floor space is limited or when the bottles cannot be stored out of sight.

10 It has also been observed that water contained in transparent plastic bottles of this type tends to oxidise during use and may be exposed to light during storage, leading to the potential generation of free radicals which can be potentially injurious to health if ingested.

15 It has further been observed that following use the bottles are generally cleaned using chemicals. This leads to the possibility that chemical residues may be left on the inner walls of the bottle despite rinsing. It will be appreciated that any chemical residue may be taken into solution in the beverage when the bottle is refilled and accordingly may be ingested when the beverage is eventually dispensed. The ingestion of such chemical residues is potentially injurious to health.

20 It has also been observed that sludge build-up in the sump and/or around the dispensing outlet can be a particular problem with units of the type described. If the dispensing outlet is not cleaned on a regular basis, the risk of contamination of beverage to be dispensed by bacteria in the sludge is likely to increase.

25 **SUMMARY OF THE INVENTION**

The present invention accordingly provides in one embodiment a dispenser unit for beverages, the dispenser unit including:-

30 a housing for receiving a bladder containing a beverage, the bladder having outlet means for dispensing the beverage; and

35 the housing being co-operable with holding means for releasably holding the outlet means relative to the housing when dispensing the beverage.

## 3.

The present invention provides in another embodiment a beverage dispenser, the dispenser including:-

a housing;

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a bladder containing a beverage, the bladder being mounted in the housing and having outlet means for dispensing the beverage wherein the dispenser includes holding means co-operable with the housing for releasably holding the outlet means relative to the housing when dispensing a beverage.

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A dispenser unit or beverage dispenser according to the present invention preferably includes a refrigerated housing.

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A beverage for dispensing according to the invention may be water, such as distilled water, spring water or filtered water. It may be a fruit juice, or milk. In a particularly preferred embodiment, spring water is made available for dispensing from a dispenser according to the present invention. Other beverages for dispensing are also envisaged within the scope of the present invention.

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A housing according to the invention may take any suitable form. The shape of the housing may be complementary to the shape of a bladder to be received therein. The housing preferably forms a cavity for receiving a bladder according to the invention. The housing may substantially enclose the bladder.

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In one preferred embodiment the outlet means projects from the housing to facilitate beverage dispensing but the housing otherwise fully encloses the bladder whereby to form a closed compartment for the bladder.

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The housing may accordingly include a compartment whereby the bladder is received in the cavity defined by walls of the compartment. The compartment may be separable from the housing. The compartment may accordingly be in the form of an insert. The arrangement may be such that the compartment is releasably receivable in the housing. The compartment may be in the form of a box. The compartment and the housing may carry complementary interengaging members whereby the compartment can be releasably located in the housing.

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## 4.

5 A housing according to the invention may include a sloping floor. The arrangement may be such that the floor assists in directing contents of the bladder towards the outlet means. In one embodiment, the floor is arranged so as to slope towards the dispensing point of the dispenser whereby when the bladder is placed in the housing the contents of the bladder are urged towards the dispensing point. A compartment according to the invention may carry the sloping floor.

10 A housing according to the invention may include an openable lid. The lid may be hinged to the housing in known manner.

15 A housing according to the invention may be insulated whereby the temperature of the bladder contents may be controlled. The housing may include inner and outer walls between which is sandwiched insulating material. Polystyrene, polyurethane and other suitable insulating materials are well known. The insulating material may be part of a separable compartment according to the invention.

20 The housing may be formed from any suitable material. Suitable materials include plastics materials, including mouldable plastics materials.

25 Other housing shapes, constructions and arrangements are envisaged within the scope of the present invention.

25 A bladder according to the invention is preferably collapsible. The arrangement is preferably such that the wall(s) of the bladder is/are collapsible in response to egress of contents of the bladder from the bladder.

30 A bladder according to the invention may be in the form of a bag in which the beverage is receivable. The bag is preferably sealable to prevent contents of the bag from escaping when placed in the bag. A bag made in the style of a liner for a wine cask may be suitably employed as a bladder according to the invention.

35 The bladder is preferably formed from a material suitable for hygienic contact with fluids for human consumption. The arrangement is preferably such that the bladder and hence the contents thereof is held under vacuum for dispensing.

35 A bladder according to the invention is preferably constructed and arranged so as to prevent the contents of the bladder from coming into contact with light during storage.

## 5.

Examples of materials suitable for use as a bladder according to invention include metallised, laminate or multi-layer films.

5 The bladder may be disposable or recyclable. Where the bladder is in the form of a laminated or multi-layer plastics material the bladder may be made available for recycling or easily discarded in a waste bin.

10 Outlet means for a bladder according to the present invention may be capable of facilitating the filling and dispensing of the contents of the bladder. The outlet means is preferably attached to the bladder. In particularly preferred embodiment the outlet means is integrally formed with or welded to the bladder. The outlet means may be in the form of a two-component valve. One component may comprise a spout which is integrally formed in a wall of the bladder. The second component may comprise a valve, tap or spigot. The valve, tap or spigot may be adapted to form a snap fit connection over the spout after the bladder is filled through the spout whereby to form the assembled two-component outlet means. Where the contents of the bladder is under vacuum, the outlet means is preferably arranged to resist ingress of air into the bladder on opening the valve, tap or spigot which would lessen or destroy the vacuum inside the bladder. The valve, tap or spigot may accordingly act as a one-way valve.

15

20 Outlet means suitable for use in accordance with the present invention may be those as are already known and used in wine casks.

25 The holding means according to the present invention is co-operable with the housing preferably to hold the outlet means relative to the dispenser. The holding means may be constructed and arranged so as to be movable relative to the housing. The holding means may be movable relative to the housing between a loading position and a dispensing position. In the dispensing position the holding means and the housing may co-operate to form an aperture, the outlet means being held in a position suitable for dispensing the beverage from the bladder in which the outlet means projects at least partially through the aperture.

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In the loading position the aperture may be opened sufficiently to allow the outlet means and hence the bladder to be removed from the housing and replaced. The holding means

## 6.

may be separated from the housing in the loading position. In an alternative arrangement within the scope of the present invention the holding means is movable relative to the housing to enlarge the aperture sufficiently to release the outlet means and hence allow the bladder to be replaced when the holding means is moved to the loading position.

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Most preferably, the holding means is slidable relative to the housing. The holding means may be releasably slidable in guides provided on the housing. In one preferred arrangement the holding means is slidable in a substantially vertical direction in a pair of opposed guides arranged on either side of a housing aperture according to the invention. In this embodiment the holding means is passed along the guides in a substantially vertical direction whereby it co-operates with the housing to releasably hold the outlet means for the bladder received in the housing aperture.

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The holding means may comprise a holding member. The holding member may be elongated. The holding member may be substantially planar. In one preferred embodiment the holding means comprises an elongated substantially planar member movable relative to the housing. The holding member preferably includes engaging means for engaging part of the outlet means. The engaging means may comprise a tongue engageable with the outlet means. In another embodiment, the engaging means comprises a recess engageable with the outlet means. Other constructions and arrangements are also envisaged within the scope of the invention.

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The holding means may include indication means for providing a visual indication of the current level of the contents of the bladder. In one embodiment the indication means comprises level indication means. In this embodiment the level indication means comprises a transparent window whereby visual observation through the window provides an indication of the current level of the bladder contents. The indication means may include graduations to assist in determining the current level of the bladder contents.

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In one particularly preferred embodiment according to the present invention the holding means comprises an elongated member having a recessed end, the arrangement being such that when the holding means is mounted on the housing the recess contacts a corresponding part of outlet means for the bladder and holds the outlet means relative to the dispenser housing, the elongated member being transparent substantially throughout its length and having a plurality of graduations marked thereon.

## 7.

5 A dispenser according to the invention may include means for monitoring and/or controlling the temperature of the cavity into which the bladder is received. Temperature monitoring means according to the present invention may comprise a probe. The probe may be held within an insulating member of the housing. Temperature control means according to the invention may comprise a thermostat as is generally known in the art.

10 A dispenser unit according to the present invention may include refrigeration means. The refrigeration means may be capable of refrigerating the contents of the bladder. In one embodiment, the refrigeration means is disposed externally to the rear of the housing. The refrigeration means may extend at least partly underneath the housing cavity for receiving a bladder according to the invention whereby the whole of the contents of the bladder may be refrigerated. In a preferred embodiment the housing includes a metal panel. The panel may comprise or form part of the sloping floor. The panel may be cooled by the refrigeration means. The panel may be in direct contact with the bladder whereby cooling of the panel by the refrigeration means effects cooling of the bladder and its contents.

15

20 A dispenser unit according to the invention may be constructed and arranged whereby it can be placed on a shelf in a refrigerator whereby a ready source of distilled water or filtered water can be made available in a domestic environment.

25 A dispenser unit according to the present invention may include at least one cup dispenser. The cup dispenser may be mounted on an external wall of the dispenser housing in known manner. In a particularly preferred embodiment, a pair of cup dispensers are mounted on opposed walls of the housing.

30 A dispenser unit according to the invention may include a water tray and a water tray grid as is known in the art. The water tray and grid may be positioned below the dispensing point of the dispensing unit.

#### BRIEF DESCRIPTION OF PREFERRED EMBODIMENT

35 The present invention will now be described with reference to particularly preferred embodiments, in which:

**Figure 1** is a side elevation of a dispenser unit in accordance with one embodiment of the present invention;

8.

**Figure 2** is a front elevation of the dispenser unit of **Figure 1**;

**Figure 3** is an exploded perspective view of a dispenser unit in accordance with one embodiment of the present invention;

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**Figure 4** is an exploded perspective view of part of a dispenser unit in accordance with one embodiment of the present invention.

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**Figure 5** is a perspective view of an alternative form of holding member;

**Figure 6** shows partial elevational views of the holding member of **Figure 5** inserted in the aperture in open and closed configurations;

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**Figure 7** is a plan view of the partial Section B of **Figure 6**;

**Figure 8** is a plan view of the partial Section A-A of **Figure 6**; and

**Figure 9** is a partial elevational view of the Section Z through **Figure 8**.

20

For convenience, in the drawings of **Figures 1 to 4** like integers have been accorded like reference numerals. The same applies to **Figures 5 to 9**.

25

Turning to the drawings, **Figure 1** shows generally a dispenser 10 for dispensing beverages, which in the embodiment shown incorporates refrigeration means 36. It will be appreciated that dispenser units according to the present invention may be provided without refrigeration means without departing from the inventive concept disclosed herein.

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Dispenser 10 includes a housing 11 having a walled compartment 12 defining a cavity 15 for receiving a bladder for beverages (not shown). Housing 11 incorporates a base 35 securable to housing 11 via securing means 29, 30, 31 passed through apertures 32, 33, 34 in base 35.

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In the embodiment shown, compartment 12 includes a sloping floor 14. It will be noted that floor 14 slopes towards the dispensing region of dispenser 10 whereby to assist the flow of bladder contents to the dispensing point in the region of outlet means 22 for the bladder.

9.

Dispenser 10 includes an openable lid 13 which with housing 11 forms a closed compartment 12 to receive the bladder.

Elongated aperture 16 is arranged on a front face 17 of housing 11. As can be seen from 5 **Figure 3**, aperture 16 tapers towards cradle 20 in which outlet means 22 for the bladder is receivable such as by seating in cradle 20. Aperture 16 incorporates opposed guides 18, 19 in which holding member 21 is slidably receivable. Holding member 21 includes an elongate body member 21a and an arcuate recess 21b arranged at a lower edge thereof. Recess 21b is capable of engaging a corresponding part of outlet means 22 for the bladder 10 whereby on seating outlet means 22 in cradle 20 holding member 21 is inserted into guides 18, 19 and slidably moved to bring recess 21b into contact with a corresponding portion of outlet means 22. In this way, a bladder may be readily held in cavity 15 and releasably secured to the housing 11 via the co-operably interengaging arrangement of holding member 21 with outlet means 22 seating in cradle 20.

15 In the embodiment shown in **Figure 4**, compartment 12 is in the form of an insert 12 comprising a box which is removable from housing 11. Box 12 carries in a front face 44 thereof an aperture 39 including opposed guides 18, 19 in which holding member 21 is receivable. It will be noted that the opposed guides of aperture 39 are in the embodiment 20 shown substantially parallel.

Aperture 39 terminates in a cradle 40 whereby to provide a further support for outlet means 22 received in cradle 20 of housing 11.

25 Insert 12 includes engaging members 41, 42 to interengage with corresponding recesses 43, 44 of housing 11 whereby to form a substantially rigid unit when assembled. Lip 45 extending around the upper periphery of compartment 12 enables compartment 12 to rest on a corresponding upper edge of housing 11.

30 In use a bladder filled with a fluid such as water under vacuum is placed in cavity 15 of compartment 12 and outlet means 22 seated in cradle 20 of housing 11. Holding member 21 is received in opposed guides 18, 19 and slidably moved towards outlet means 22 seated in cradle 20 whereby recess 21b carried by holding member 21 engages with a corresponding portion of outlet means 22 and is thereby secured relative to housing 11.

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The beverage may now be dispensed by taking a cup 25 from cup dispenser 23, placing it on the grid (not shown) of water tray 28 received in water tray housing 27 and opening outlet means 22 to dispense the required quantity of beverage.

5      Exhausted bladders may be easily replaced by reversing the procedure described whereby to release the outlet means 22 and remove the bladder from cavity 15.

10     The present invention has the advantage that bladders may be easily inserted into and replaced in dispenser units according to the present invention. Furthermore, dispenser units according to the present invention are able to dispense beverages in the hygienic manner not previously obtainable with dispensers of the present art. Moreover the filled bladders may be stored in boxes which can be more conveniently stacked than the prior art bottles.

15     In the embodiment shown in **Figures 5 to 9**, a particularly preferred form of holding member 50 is shown for use in the housing 49. It forms an aperture 48 with the arcuate wall of the housing 73 to hold the outlet means 79.

20     The holding member 50 is formed from a transparent moldable plastic material in order that a user may be able to look through the holding member into the housing to determine the state of fill of the bladder contained therein.

25     The holding member is formed with a flat elongate body portion 51. The lower portion of the holding member is formed with an arcuate recess 52 which is adapted to fit part of the way around the tubular spout 80 of the outlet means in the matter illustrated best in **Figure 9**.

30     A curved lip 53 is provided at the top of the holding member to give a user purchase on the holding member. Thus the user may slide the holding member up and down in the guide channels 70. The guide channels are formed on either side of the elongate aperture 48 as an edge of the housing wall 71 surrounding this region.

35     Integral resilient legs 58 extend from the upper part of both sides of the holding member, the legs being formed with a ramped extension 59. Each resilient leg with ramped extension is arranged to abut against a ledge 57 provided in the guide channels in order to hold the holding member in the elevated position shown on the left hand side of the

11.

Figure 6. This facilitates insertion of the dispenser into the aperture 48 after which the holding member 50 may be pushed downward to lock the dispenser in place when the holding means reaches the position shown on the right side of the drawing shown in Figure 6. It is noted that the ledge 57 and the bottom of the ramped extension 59 are angled so that the ramped extension will be pushed inwardly when sufficient downward pressure is applied to the top of the holding member thereby allowing the holding member to slide past the ledge 57.

10 The holding member also includes two integral resilient elements 60. These are also in the form of legs each being provided with a catch member 61 which is adapted to catch under the abutment 66 provided in the guide channel. This construction limits the upward travel of the holding member in the guide channel and thus prevents it becoming separated from the channels. Integral fins 65 extending along the length of each of the vertical sides of the holding member are also provided to assist with tracking of the holding member in 15 the guide channels provided on either side.

20 The outlet means 79 which includes the tubular spout 80 and a deformable spigot 90 snap fitted on the end thereof is held securely in the aperture of the housing. This is by virtue of the fact that the holding member fits into a channel formed between the two annular reinforcing ribs 82 and 83 formed on the tubular spout. Similarly, the arcuate housing wall also fits into the same channel.

25 An annular flange 81 is provided on the end of the tubular spout and provides a surface whereby the spout may be heat sealed or welded to a bladder (not shown).  
The walls of the housing may be hollow to accommodate filling with insulation 72 and also to reduce weight.

30 The dispenser is operated simply by manipulation of the toggle 91 provided on the spigot to dispense content from the bladder held in the housing.

35 While it has been convenient to describe the invention in relation to particularly preferred embodiments, it is to be appreciated that other constructions and arrangements are considered as falling within the scope of the invention. Various modifications, alterations, variations, and/or additions to the constructions and arrangements herein are also considered as falling within the scope and ambit of the present invention.

12.

## CLAIMS

1. A dispenser unit for beverage including:-  
5 a housing for receiving a bladder containing a beverage, the bladder having outlet means for dispensing the beverage;  
  
an aperture provided on the housing, the aperture being arranged to receive the outlet means of a bladder placed in the housing to allow the outlet means to project at least partially therethrough; and  
  
10 holding means slidable in a pair of opposed guides provided on the housing to co-operate with the housing to releasably hold the outlet means in the aperture.
2. A dispenser unit according to claim 1 including a refrigerated housing.  
15
3. A dispenser unit according to claim one wherein the housing includes a refrigerated metal panel which forms at least part of the floor of the housing.
4. A dispenser unit according to claim 1 wherein:-  
20 the outlet means includes a tubular spout connected to the bladder;  
  
the tubular spout is provided with a circumferential channel formed between two spaced annular ribs provided on the tubular spout; and  
  
25 the holding means is arranged to slide into the circumferential channel when the outlet means projects at least partially through the aperture.
5. A dispenser unit according to claim 1 wherein the holding means includes limiting means for limiting the extent to which the holding means may be slidable away from the aperture.  
30
6. A dispenser unit according to claim 5 wherein:-  
35 the holding means is slidable in a substantially vertical direction in the pair of opposed guides;  
  
the holding means include at least one resilient element;

13.

a corresponding abutment is provided in association with at least one of the opposed guides; and

5 the catch member and corresponding abutment interengage to prevent the holding means from sliding out of engagement with the opposed guides.

10 7. A dispenser unit according to claim 5 wherein the holding means include rest means to hold the holding means in a position clear of the outlet means to allow the outlet means to be inserted through the aperture.

15 8. A dispenser unit according to claim 7 wherein the rest means include at least one resilient leg which is adapted to co-operate with a corresponding ledge provided in association with at least one of the opposed guides.

20 9. A dispenser unit according to claim 1 wherein the holding means is formed of a transparent material.

10. A dispenser unit according to claim 1 including a removable drip tray located on the housing at a position beneath the outlet means to capture beverage spilt therefrom.

25 11. A dispenser unit according to claim 1 wherein the outlet means includes a tubular spout and a valve, tap or spigot adapted to form a snap fit connection over the spout after the bladder is filled.

12. A dispenser unit for beverage including, a refrigerated housing containing a bladder holding a beverage, the bladder having outlet means including a tubular spout provided with a circumferential channel and a resiliently deformable spigot snap fitted on the tubular spout, an aperture provided on the housing, the aperture being arranged to receive the outlet means of a bladder placed in the housing to allow the outlet means to project therethrough, and holding means slidably in a pair of opposed guides provided on the housing to co-operate with the housing to releasably hold the outlet means in the aperture, the holding means being slidable

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14.

in a substantially vertical direction in the pair of opposed guides and including at least one resilient element provided with a catch member which is adapted to co-operate with a corresponding abutment provided in association with at least one of the opposed guides to prevent the holding means from sliding out of engagement with the opposed guides.

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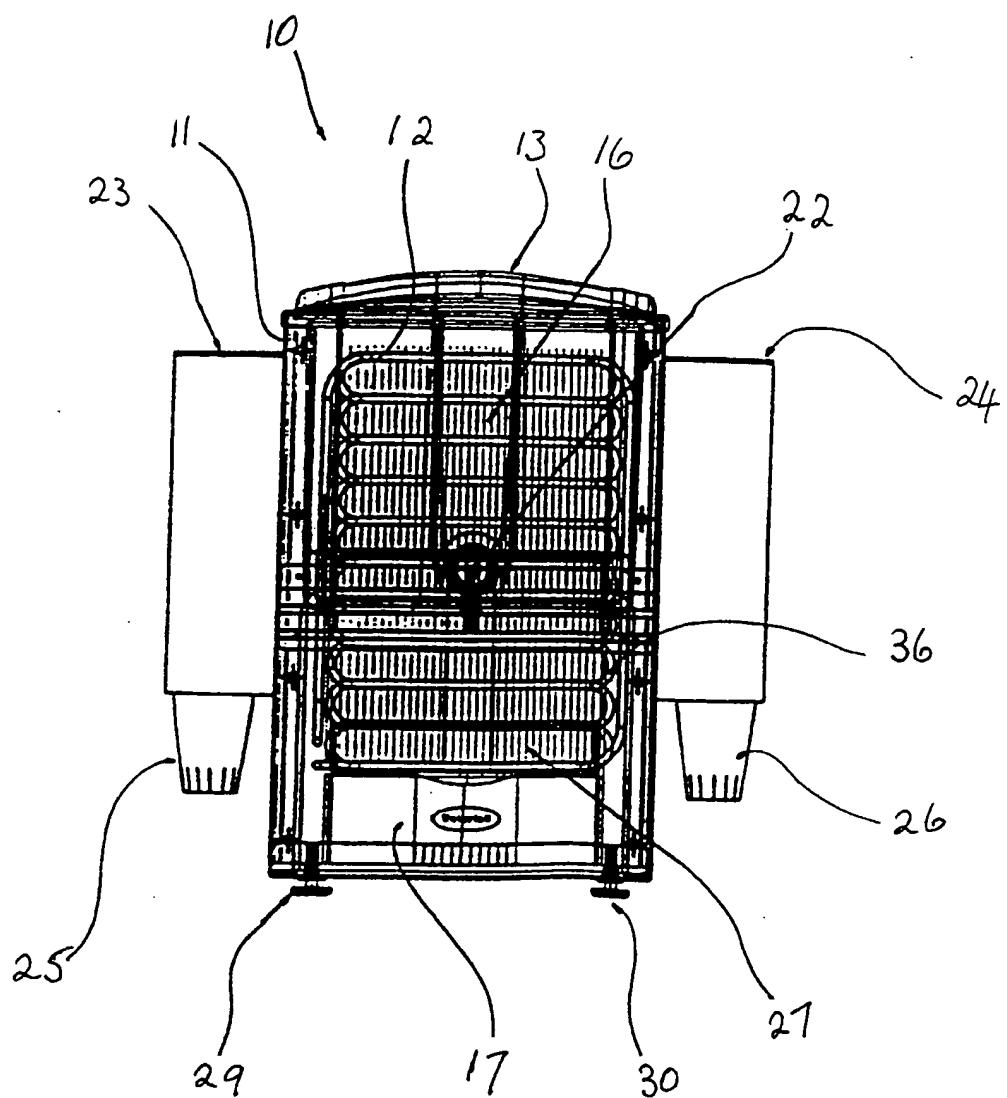


Fig 1

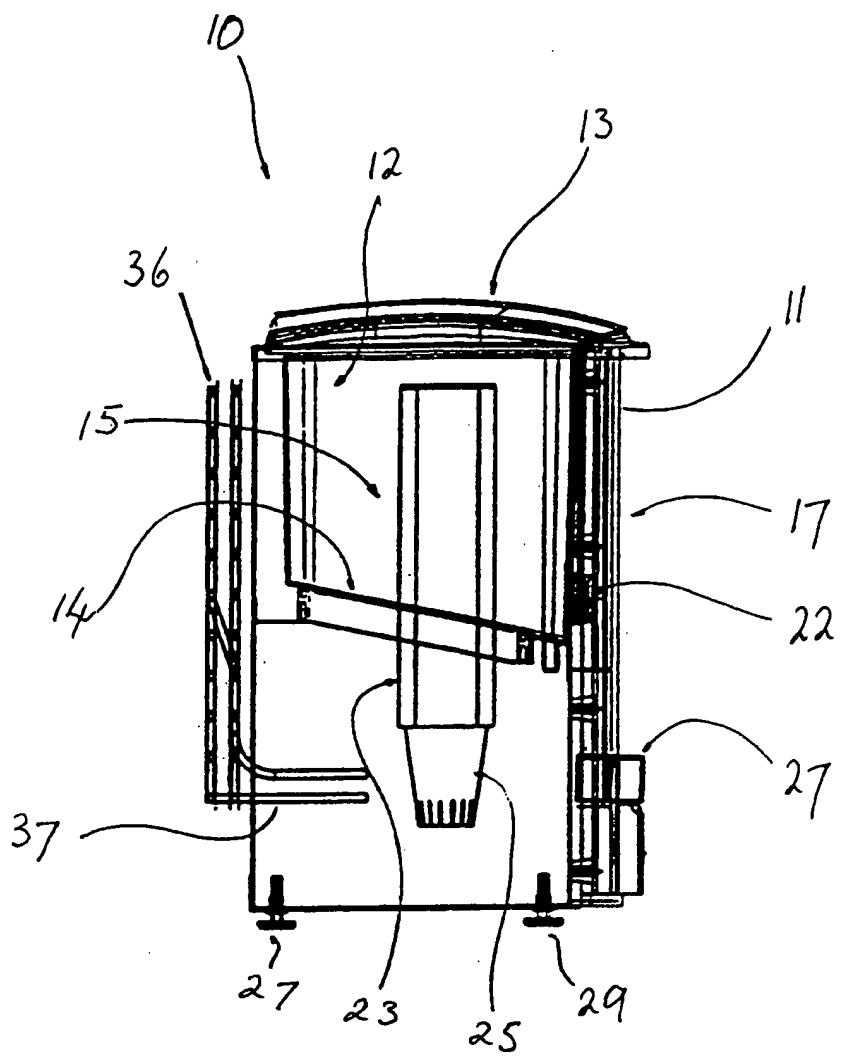


Fig 2

3 / 7

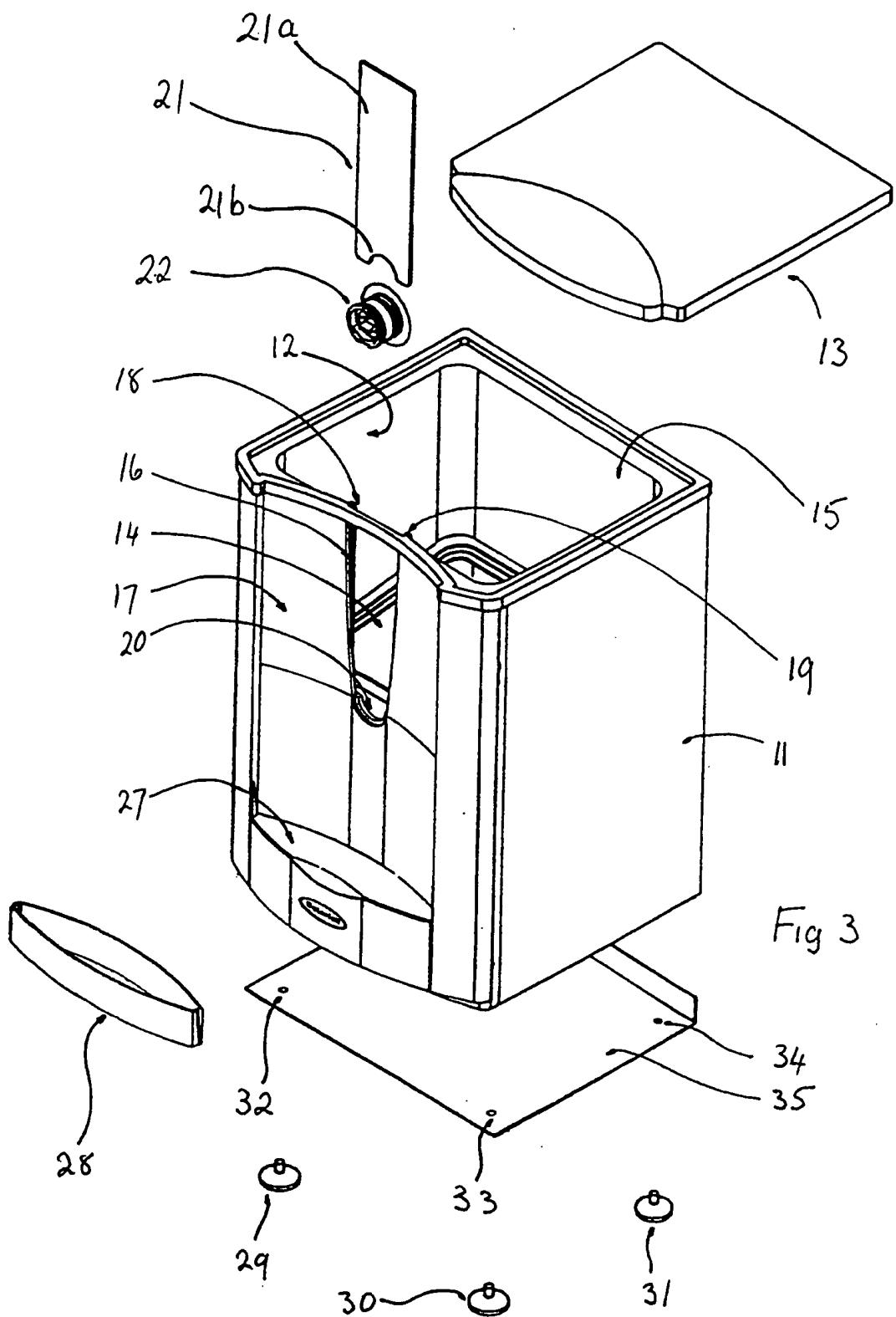


Fig 3

4 1 7

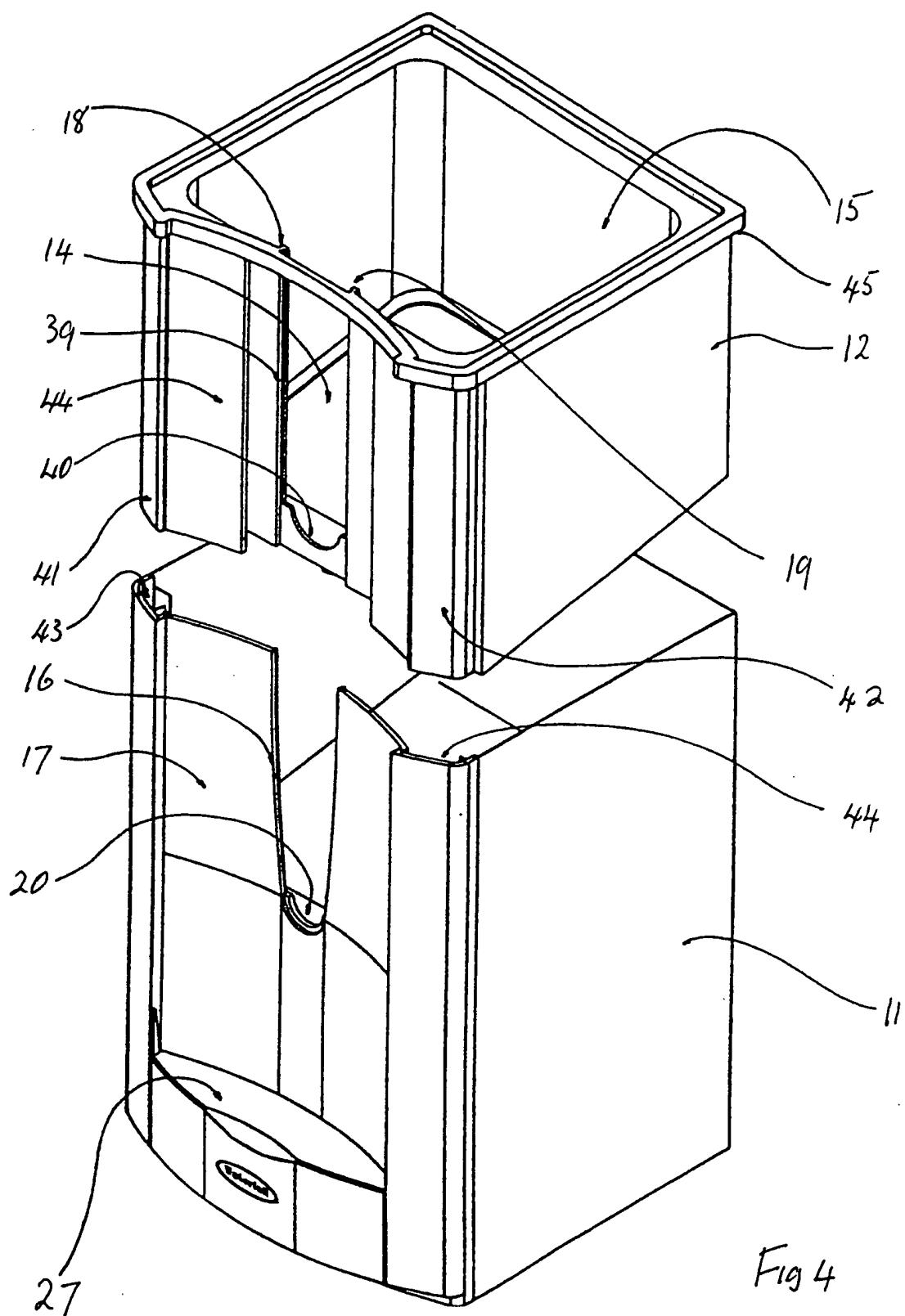
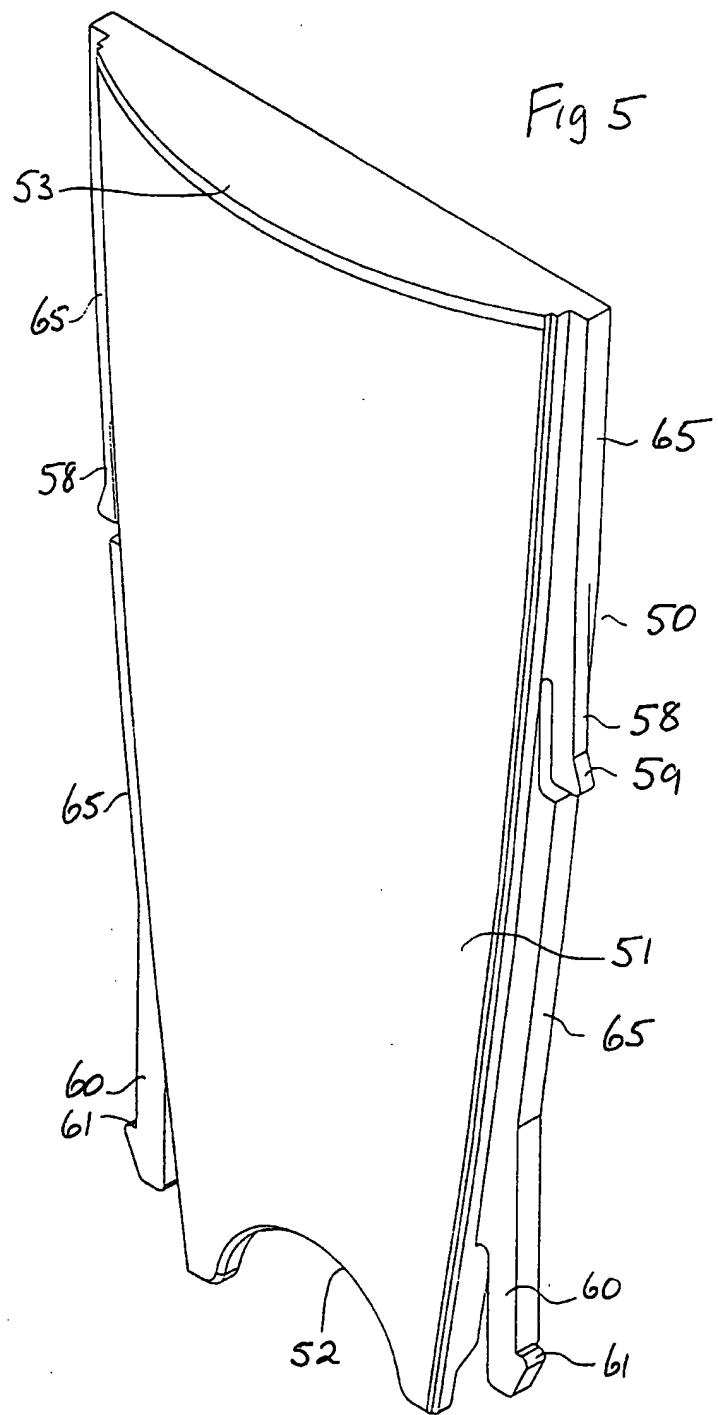
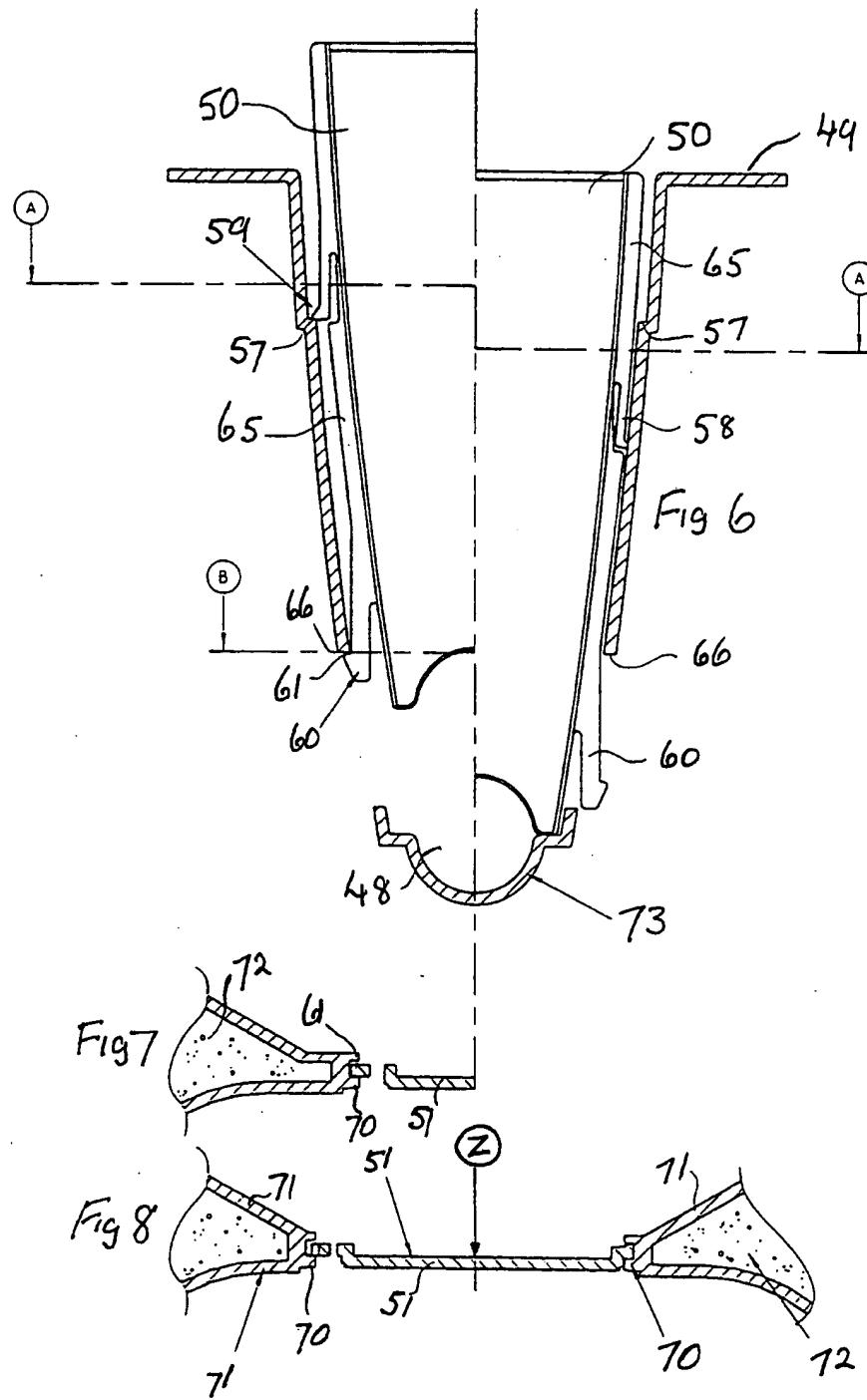
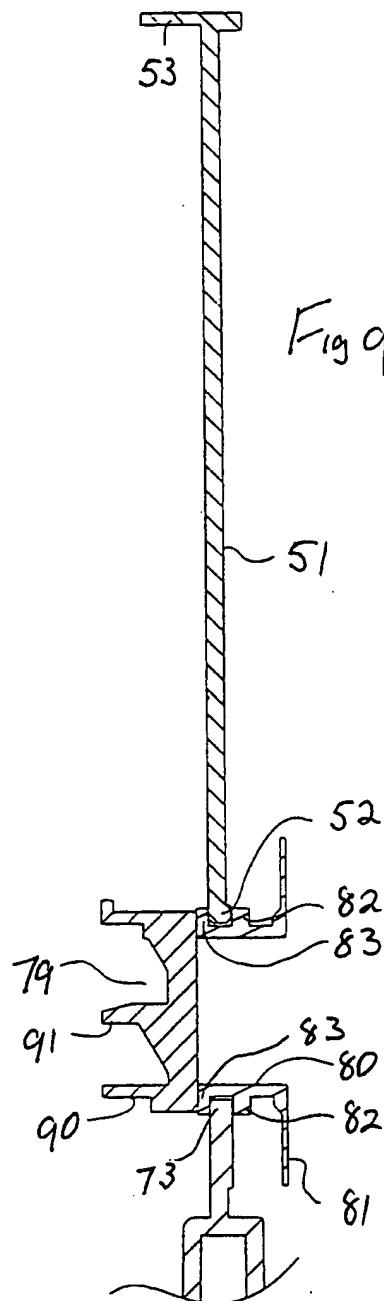


Fig 4







# INTERNATIONAL SEARCH REPORT

International Application No.

PCT/AU 98/00487

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|--|--|---|
| <b>A. CLASSIFICATION OF SUBJECT MATTER</b>   |  |   |
| Int Cl: B67D 3/00, 5/62  |  |   |
| According to International Patent Classification (IPC) or to both national classification and IPC  |  |   |
| <b>B. FIELDS SEARCHED</b>  |  |   |
| Minimum documentation searched (classification system followed by classification symbols)  |  |   |
| IPC: B65D 77/04, 77/06, 81/18, 81/38; B67D 3/00, 3/02, 3/04  |  |   |
| Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched  |  |   |
| AU: IPC as above; B67D 5/62  |  |   |
| Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)   |  |   |
| WPAT: Cool: OR chill: OR refrig: AND guid: OR hold: OR retain: OR slid: OR slot: OR lock:  |  |   |
| <b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>  |  |   |
| Category*  | Citation of document, with indication, where appropriate, of the relevant passages                   | Relevant to claim No.                                       |
| X  | AU 70108/87 A (THE DECOR CORPORATION PTY LTD) 8 October 1987<br>whole document                       | 1,2,4,9,11  |
| X  | AU 32716/84 A (RAFFERTY) 4 April 1985<br>whole document  | 1,4,11  |
| X  | AU 26075/84 (556931) B (KARPISEK) 4 October 1984<br>Page 2 line 11 to page 3 line 6, figures 1 to 10 | 1,4,5   |
| X  | AU 53884/79 A (MURFET) 18 December 1980<br>Page 2 lines 8 to 15, figures 1 to 4                      | 1,2,4,9,10  |
| <input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C  |  | <input checked="" type="checkbox"/> See patent family annex |
| <p>* Special categories of cited documents:</p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> <p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art</p> <p>"&amp;" document member of the same patent family</p> |  |   |
| Date of the actual completion of the international search<br>15 July 1998  | Date of mailing of the international search report<br><b>23 JULY 1998</b>                            |   |
| Name and mailing address of the ISA/AU<br>AUSTRALIAN PATENT OFFICE<br>PO BOX 200<br>WODEN ACT 2606<br>AUSTRALIA<br>Facsimile No.: (02) 6285 3929   | Authorized officer<br><b>DEREK BUTLER</b><br>Telephone No.: (02) 6283 2347                           |   |

**INTERNATIONAL SEARCH REPORT**International Application No.  
PCT/AU 98/00487

| <b>C (Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT</b> |   |                              |
|---|---|------------------------------|
| <b>Category*</b>  | <b>Citation of document, with indication, where appropriate, of the relevant passages</b> | <b>Relevant to claim No.</b> |
| X   | WO 91/10616 A (BARBER) 25 July 1991<br>whole document                                     | 1,2,4,9,10,11                |
| X   | GB 2188305 A (GATLEY) 30 September 1987<br>page 1 lines 48 to 75, figures 1 to 3          | 1,2,4,9,11                   |
| A   | AU 12733/92 A (YOUNG) 3 September 1992<br>whole document                                  | 1-12                         |

**INTERNATIONAL SEARCH REPORT**  
Information on patent family members

International Application No.  
**PCT/AU 98/00487**

This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

| Patent Document Cited in Search Report |          |    | Patent Family Member |
|--|----------|----|----------------------|
| AU                                     | 70108/87 |    | NONE                 |
| AU                                     | 32716/84 |    | NONE                 |
| AU                                     | 26075/84 |    | NONE                 |
| AU                                     | 53884/79 |    | NONE                 |
| WO                                     | 91/10616 | AU | 71739/91             |
| GB                                     | 2188305  |    | NONE                 |
| AU                                     | 12733/92 | WO | 92/14978             |

END OF ANNEX